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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,182	06/30/2003	Dennis K. Killinger	1372.08.PRWOUS	1181

21901 7590 12/11/2008

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EXAMINER	
BELLO, AGUSTIN	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
12/11/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/604,182	**Applicant(s)** KILLINGER, DENNIS K.	
	Examiner Agustin Bello	**Art Unit** 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,6,12-27,30-33 and 36* is/are pending in the application.

4a) Of the above claim(s) *12-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6,18-27,30-33 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 6, 18-27, 30-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rees (Patent No. US 6,034,760 A).

Regarding claim 1, Rees teaches at least one laser (reference numeral 12 in Figure 3) adapted to generate coherent light simultaneously at multiple wavelengths (i.e. 16a, 34a, 16b, 34b, 16c, 36c in Figure 3); said receiver including at least one detector (reference numeral 87, 96, 98, 100 in Figure 3) adapted to detect said coherent light at multiple wavelengths; said at least one laser and said at least one detector being positioned in out of line-of-sight relation to one another (as seen in Figure 3 where receiver 87 lies on a different plane that laser 12), said at least one laser positioned at a first fixed location and said at least one detector position at a second fixed location (as seen in Figure 3), a barrier (reference numeral 70, 80, 82, 86 in Figure 3) between said at least one laser and said at least one detector, said barrier causing said at least one laser and said at least detector to be in said out of line-of-sight relation to one another (as seen in Figure 3 where receiver 87 lies on a different plane that laser 12), a plurality of external remote targets and target spatial regions fixed in line-of- sight relation to said at least one laser and in line-of-sight relation to said detector (as seen in Figure 1); said external remote targets and target spatial regions including trees, buildings, clouds, atmospheric aerosols, and like objects

that are out-of-doors relative to said at least one laser (as seen in Figure 1); a modulating device (reference numeral 24 in Figure 3) connected in modulating relation to said at least one laser; said modulating device adapted to modulate each of said multiple wavelengths (i.e. 16a, 16b, 16c in Figure 3) so that multiple messages are transmitted simultaneously; said communication device adapted to aim said modulated light from said at least one laser at said plurality of external remote targets and target spatial regions to separate spatially different communication optical signals from one another (reference numeral 16 in Figure 1); said at least one detector adapted to demodulate light scattered by said target (reference numeral 96 in Figure 3); said at least one detector including an optical bandpass filter (reference numeral 91 in Figure 3) adapted to pass preselected wavelengths of light and reject wavelengths of light outside of said preselected wavelengths; whereby multiple messages are simultaneously transmitted along multiple wavelengths (16b, 16c in Figure 3); and whereby said multiple messages are individually detected by said at least one detector (reference numeral 87 in Figure 3), and whereby at least one laser beam follows a generally "V"-shaped path of travel between said at least one laser and said at least one detector (as noted in Figure 3 by the outgoing beam 34a and returning beam 76). Rees differs from the claimed invention in that Rees fails to specifically teach that the multiple wavelengths used are at different frequencies. However, the use of multiple wavelengths at different frequencies is well known in the art and Official Notice is given to that effect. Furthermore, as admitted by applicant ("Remarks" pages 10 and 11 filed 05/28/08), lasers that are adapted to generate coherent light simultaneously at multiple wavelengths and different frequencies are well known in the art and have been for nearly fifty years. One skilled in the art would have been motivated to employ such a laser in the apparatus

of Rees in order to allow for a greater amount of information to be obtained from the return signal such as directional information. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a well-known laser that generates coherent light simultaneously at multiple wavelengths and different frequencies in Rees.

Regarding claims 6, 18, and 19, Rees teaches a first data communication device (reference numeral 12, 24, 38 in Figure 3) adapted to transmit multiple sets of data through multiple wavelengths (i.e. 16a, 16b, 16c in Figure 3), there being as many wavelengths as there are sets of data (i.e. each wavelength carriers a data set); a laser source (reference numeral 12 in Figure 3) modulated by said first data communication device; a transmitter telescope (reference numeral 74 in Figure 3) adapted to aim modulated light of said multiple wavelengths from said laser source to a plurality of light-reflecting multiple external remote targets (reference numeral 16 in Figure 1); said plurality of light-reflecting multiple external remote targets including trees, buildings, clouds, atmospheric aerosols, and like objects that are out-of-doors relative to said first data communication device (i.e. all of the out-of-doors elements seen in Figure 1); a second data communication device (reference numeral 87. 96, 98, 100, 104, 108, 112 in Figure 3) adapted to receive multiple sets of data carried by said multiple wavelengths (i.e. 16a, 16b, 16c in Figure 3); said first and second data communication devices not being positioned in line-of-sight relation to one another (as seen in Figure 3 where receiver 87 lies on a different plane that laser 12), an optical detector (reference numeral 92 in Figure 3) connected in driving relation to said second data communication device, said optical detector adapted to generate electrical signals corresponding to detected optical signals; a receiving telescope (reference numeral 74 in Figure 3) aimed at said plurality of light-reflecting external remote targets and adapted to collect

modulated light reflected from said plurality of light-reflecting external remote targets at said multiple wavelengths and to deliver said modulated light to said optical detector; an optical bandpass filter (reference numeral 91 in Figure 3) connected between said receiving telescope and said optical detector; a barrier means (reference numeral 70 in Figure 3) adapted to be positioned between said first and second data communication devices, said barrier means preventing line-of-sight communication between said first and second data communication devices; said communication device being adapted to aim said modulated light from said laser at said plurality of external remote targets to separate spatially different communication optical signals from one another (reference numeral 16 in Figure 1); said transmitter telescope causing modulated light at multiple wavelengths to reflect from said plurality of light-reflecting different multiple external remote targets (reference numeral 16 in Figure 1); said receiver telescope (reference numeral 74 in Figure 3) causing reflected light at said multiple wavelengths to focus on said optical detector; said second data communication device receiving electrical signals from said first data communication device (i.e. after reflection by atmosphere and conversion by converter 92 in Figure 3); said first data communication device positioned at a first fixed location and said second data communication device positioned at a second fixed location remote from said first fixed location (as seen in Figure 3), and said optical bandpass filter (i.e. filter 91 for each of the wavelengths 16a-16c in Figure 3) passing each of said multiple wavelengths to said optical detector so that multiple messages are sent simultaneously from said first data communications device to said second data communications device,.

Regarding claim 20, Rees teaches a laser (reference numeral 12 in Figure 3) adapted to generate a LIDAR beam (i.e. a laser beam); a data transmitting device (reference numeral 24 in

Figure 3) for modulating said laser; a transmit telescope (reference numeral 74 in Figure 3) adapted to aim said LIDAR beam at a remote target; a receiver telescope (reference numeral 74 in Figure 3) adapted to collect said LIDAR beam after said LIDAR beam has reflected from said remote target; an optical detector means (reference numeral 92 in Figure 3) in communication with said receiver telescope, said optical detector means adapted to generate electrical signals upon receiving reflected light from said receiver telescope; a data receiving device (reference numeral 112 in Figure 3) adapted to receive electrical signals from said optical detector; said data transmitting device and said data receiving device not being positioned in line-of-sight relation to one another (as seen in Figure 3 where receiver 87 lies on a different plane that laser 12), said LIDAR communication system being adapted to aim said modulated light from said LIDAR beam at a plurality of external remote targets and target spatial regions to separate spatially different communication optical signals from one another (reference numeral 16 in Figure 1); said external remote targets and target spatial regions including trees, buildings, clouds, atmospheric aerosols, and like substantially stationary objects that are out-of-doors relative to said laser (i.e. the environment shown in Figure 1); said data transmitting device positioned at a first fixed location and said data receiving device positioned at a second fixed location remote from said first fixed location (as seen in Figure 3) , and said data receiving device receiving data from said data transmitting device even when said data receiving device is positioned in a location distant from said data transmitting device (i.e. the receiver receives continually receives the transmitted light signal) and when at least one obstacle prevents line-of-sight communication between said data transmitting device and said data receiving device (i.e. the objects in the environment that reflect the laser beam), whereby said LIDAR beam follows a

generally "V" shaped path of travel from said laser to said data receiving device detector (as noted in Figure 3 by the outgoing beam 34a and returning beam 76).

Regarding claim 21, Rees teaches an electrical signal conditioner (reference numeral 26 in Figure 3) disposed in electrical communication between said data transmitting device and said laser, said electrical signal conditioner adapted to condition signals from said data transmitting device.

Regarding claim 22, Rees teaches an electrical signal conditioner (reference numeral 96, 98, 100, 104, 108 in Figure 3) disposed in electrical communication between said optical detector and said data receiving device, said electrical signal conditioner adapted to condition electrical signals from said optical detector.

Regarding claim 23, Rees teaches an optical bandpass filter (reference numeral 91 in Figure 3) between the receiver telescope and said optical detector (reference numeral 92 in Figure 3).

Regarding claims 24 and 26, Rees teaches multiple optical wavelengths (i.e. 16a-16c in Figure 3) for communication of different communication signals simultaneously when the same external remote target is used as a common target for multiple communication devices.

Regarding claims 25 and 27, Rees teaches multiple optical wavelengths (i.e. 16a-16c in Figure 3) for communication of different communication signals simultaneously when the same external remote target is used as a common target for LIDAR communication devices (i.e. a laser).

Regarding claims 30, 31, 32, and 33, Rees teaches an optical signal transmitted to a remote external target (reference numeral 16 in Figure 1) wherein the backscattered optical

signal is detected simultaneously by multiple telescope receivers positioned at different locations (i.e. as seen in Figure 2 and 3).

Regarding claim 36, Rees teaches the communication device of claim 1, further comprising: a plurality of external remote targets including atmospheric back scatter in non-line-of- sight relation to said detector (i.e. any of the atmospheric backscatter shown in Figure 1 that are non-line-of sight with detector 10 in Figure 1); said detector adapted to detect multipath backscatter from said multiple backscatter spatial target regions (reference numeral 16 in Figure 1; also 16a, 16b, 16c in Figure 3).

Response to Arguments

3. Applicant's arguments filed 05/28/08 have been fully considered but they are not persuasive.

Applicant argues that Rees fails to teach that the laser is modulated with communication data. However, Rees clearly teaches an electro-optic modulator that modulates light output by a laser with coded pulses. Furthermore, the examiner notes that Rees' channels are clearly modulated first by the transmission modulator, then by the infrasound of the atmosphere. Through this dual modulation, a vast amount of information regarding the distance from and the nature of atmospheric disturbances is communicated to the airplane and eventually the operator of the airplane. Therefore, at least in a broad sense, the wavelengths and probe volumes of Rees can be considered as communications channels. As such, the examiner maintains that Rees teaches modulation of laser light with data.

Next, applicant argues that Rees fails to specifically teach an outgoing modulated laser beam at a first fixed position that is reflected off trees or the like at a remote second fixed

position in line-of-sight relation to the first fixed position toward a third fixed position that is in line-of-sight relation to the second fixed position but not in line-of sight relation to the first fixed position. However, the examiner maintains that Rees clearly teaches as much via disclosure of a laser and receiver in a non-line-of-sight relation to one another and the light beams they respectively transmit and receive via reflection from remote objects that are necessarily in a line-of-sight relation with the transmitter and receiver. As to applicant's assertion that Rees fails to teach the newly claimed V-shaped path, the examiner notes the V-shaped path formed by 34a and 76 in Figure 3.

Next, applicant argues against the rejection of claims 6, 18 and 19. Applicant asserts that a barrier means as claimed is not taught by Rees. However, and as noted in the office action, the examiner maintains that a barrier means is clearly taught by Rees at least via disclosure of element 70 in Figure 3. Rees' element 70 in Figure 3 clearly positioned between the transmitter and receiver and prevents line-of-sight communication between the two. In other words, at no time are the transmitter laser and receiver in a direct line-of-sight relation to each other due to the use of reflector 70. Furthermore, in response to applicant's assertion that no barriers exist between the outgoing laser path and the incoming laser path, the examiner again notes element 70 which acts as a barrier.

In response to applicant's argument regarding the fixed relation between the first and second communication elements, the examiner notes that Rees (Figure 3) clearly teaches that the laser is in a first fixed position and the detector is in a second fixed position that is remote from the first fixed position. As to applicant's arguments for a reflection from a second fixed position to a third fixed position, the examiner notes that the claim language fails to recite this limitation.

Furthermore, as noted by applicant, the remote targets sensed in Rees are clearly in a line-of-sight relation to the transmitter and receiver, at least by virtue of the transceivers ability to transmitter and receiver signals reflected from the remote targets.

Next, applicant argues that the laser beams of Rees are not aimed at anything. However, this is clearly not true given that the laser beams are at least aimed ahead of the aircraft. As to applicant's argument that Rees' multiple telescopes are positioned inside an aircraft or airport building and are therefore not positioned in different locations, the examiner notes that their position within the aircraft does not preclude them from being placed in different positions within the aircraft. In fact, the telescopes are clearly positioned in different locations within the aircraft given that all 128 probe volumes must form a diverging cone in front of the aircraft. Furthermore, Figure 3 shows the transmission and reception of signals at different positions. Moreover, the examiner again notes that the cited CCD is the receiver for the telescope and is itself comprised of millions of tiny pixels each of which is sensitive to light. Putting the above together, the CCD is interpreted as disclosing multiple telescope receivers in that each telescope includes a CCD and this CCD is comprised of a multiple receivers.

Rees clearly discloses that the wavelengths are targeted towards and reflected from physical objects that are part of the external environment at least through disclosure of targeting and reflection from atmospheric aerosols, clouds, and the like (Figure 1). The examiner further notes that sound waves are nothing more that the vibration of aerosols or atmospheric elements, and by target theses elements and detecting light reflected from these elements it is possible to determine the location of storms, etc. Moreover, and given the apparent lack of criticality as to what is targeted in the claimed invention, the examiner contends that Rees' invention is also

applicable to targeting trees and buildings since these too create atmospheric vibrations that would be detectable by the system of Rees. Rees also appears to suggest as much via disclosure that it is well known in the art to detect similar objects such as ships, submarines, or animals.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., separate transmitting and receiving telescopes) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). While applicant contends that claim 20 makes it clear that two separate telescopes exist, the examiner has a different opinion and interpretation of the claim language. In that opinion and interpretation, the claim language simply requires a transmitter and receiver telescope with any clear indication that the telescopes are separate and distinct. Furthermore, Rees' lightwaves are clearly reflected from the atmospheric particles. As such, the particles can be considered as the one obstacle that prevents line of sight communication being that light is reflected as opposed to being directly transmitted and received by Rees' apparatus. Rees also discloses at least one other obstacle via disclosure of mirror 70 which, as discussed above, clearly prevents line-of-sight communication between the transmitting device and the receiving device.

As to applicant's argument against the rejection of claim 36, the examiner maintains that Rees teaches the claimed plurality of external remote targets at least through disclosure of reflection of light from particles in the atmosphere. The examiner also maintains that these reflections would produce multipath scatter which is then detected by Rees' apparatus. Furthermore, there being no structural difference between the claimed invention and the prior art,

the examiner maintains that the claimed invention is not patentably distinguished from the prior art. If the prior art structure is capable of performing as claimed, then it meets the claim. In this case, the apparatus of Rees is clearly capable of performing as claimed given that no structural difference exists between the claimed invention and the cited prior art.

As to applicant's argument that Rees fails to teach LIDAR, the examiner notes that the system of Rees is an optical remote sensing technology that measures properties of scattered light to find a range and/or information of a distant target. As such, Rees' system is by definition a LIDAR system.

Given the above, the examiner maintains that the cited prior art anticipates or obviates the claimed invention.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Agustin Bello/

Primary Examiner, Art Unit 2613